

# TRIZ application process at Samsung Electronics

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## 1. Background

There were so many TRIZ application methods and processes around world. But we felt that those methods have not been suitable for Samsung Electronics based on our TRZ experience in practical project.

TRIZ has been used for mainly problem solving at the fields as below.

1. Existing product improvement for quality and performance
2. Securing core technology for new product
3. Manufacturing technology for increasing productivity
4. Patent issues (Infringement, avoidance)

It was necessary for Samsung Electronics to have unique problem solving process by using TRIZ. It also helps TRIZ trainees to understand overall process for TRIZ projects and to carry out their own projects. Therefore we first developed TRIZ application process at Samsung Electronics in 2004 and have improved it so far by reflecting many opinions of TRIZ experts.

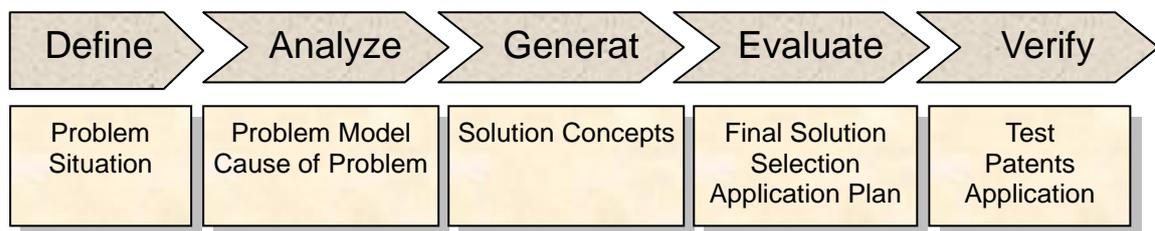
## 2. TRIZ project process

We have been trying to set up TRIZ project process at Samsung Electronics based on our experience. Although we have ARIZ which is very effective for problem solving, but it is difficult for trainees to use it from first time.

We needed to organize TRIZ project process for more effective project management. We classified Samsung TRIZ project process into five stages: define, analyze, generate, evaluate, and verify as shown in Figure 1. The “define” is the stage where problem is defined. We can use ISQ (Inventive Situation Questionnaire)

to clarify problem situation. The “Analyze” is the stage where problem is analyzed and core cause of problem is identified. The “Generate” is the stage where many solutions are generated by using TRIZ tool. The “Evaluate” is the stage is where concepts are evaluated and final solution is selected. The “Verify” is the stage is where final concept is tested and applied to patents. CAE(Computer Aided Engineering) Tools can be used to evaluate final concept if test is not easy.

After we see that there is no problem, the final concepts are applied to real product.



**Figure 1 TRIZ Project Process at Samsung Electronics**

### 3. Roadmap of TRIZ problem solving process

Fig. 2 reflects roadmap of TRIZ problem solving process that we describe it in detail as below.

At “Define” stage, project overview such as background and objective is described. Problem situation and system information are also described in detail.

Bypass approach is the stage where we check the possibility for problem solving by changing point of view for system and time. We use multi-screen thinking tool for redefining what to solve at this stage.

At “Analyze” stage, we need to find cause of problem and to build problem model. We use function analysis and RCA(root cause analysis) for getting core problem and cause of product and we build problem models such as contradiction, Su-field model and required function. If we already know the cause of problem clearly, we don’t have to use function analysis or RCA.

Then we identify available resources and IFR. It means that we are ready to come up with solution concepts.

At “Generate” stage, we produce solution concepts as many as possible by using TRIZ tool. We use inventive principle for removing contradiction, standard solutions for Su-field model and Effects for required function. Goldfire Innovator(TRIZ SW) is used to get appropriate scientific effects and knowledgebase. It also helps us to use analyzing tools such as function modeling and RCA. We also use trimming, evolution trend and FOS(Function Oriented Search) at this stage.

Even though we produced lots of ideas by using TRIZ Tools, there can be a case that problem cannot be solved and solutions are not OK. In that case, we move to non-standard problem solving stage by using ARIZ.

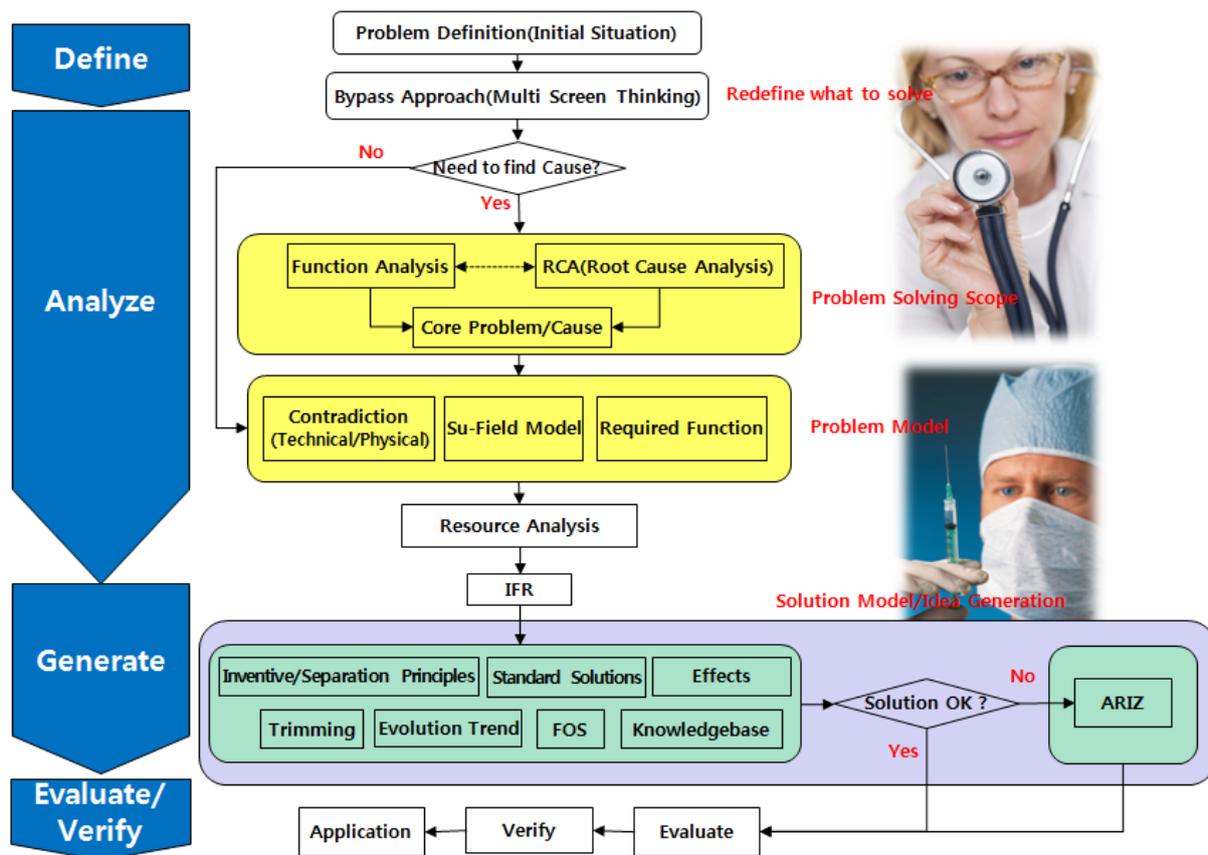


Figure 2. Roadmap of TRIZ problem solving process

After generating solution concepts, all the concepts are evaluated for application and final some concepts are selected at “Evaluate” stage. Evaluation tools such as Pugh matrix and Payoff matrix are used at this stage.

At “Verify” stage, final concepts are tested by making prototype and by applying idea to process. Some concepts are applied for patents after checking if there are similar patents. After passing criteria for quality and performance, final concepts are applied to real product and process.

### **3. Conclusion**

We developed unique TRIZ application process for problem solving at Samsung Electronics. It helps us to use TRIZ effectively and systematically.

Samsung Electronics has achieved lots of good results by applying this roadmap of problem solving process. We will try to update and improve it continuously by searching and adopting new creative thinking tools.